Small Business Innovation Research/Small Business Tech Transfer

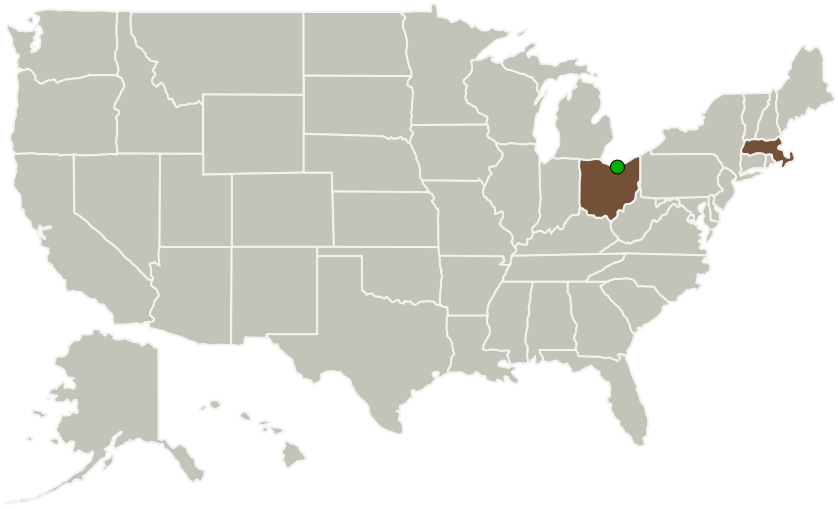
Inverted 3J Tandem Thermophotovoltaic Modules, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Spire Semiconductor proposes to make an InGaAs-based three-junction (3J) tandem thermophotovoltaic (TPV) cell to utilize more of the blackbody spectrum (from a GPHS) efficiently. Semi-insulating InP wafers will be used for monolithically integrated module (MIM)compatibility and to achieve low free-carrier absorption. In Phase 1, we will design, epitaxially grow, and process large area single junction test cells for each of the three bandgaps proposed (to evaluate material quality), as well as for a full tandem cell structure. In Phase 2, we would further refine the structure and incorporate the material into MIM modules.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Spire Semiconductor, LLC	Lead Organization	Industry	Hudson, New Hampshire
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

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Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138235)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Spire Semiconductor, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Steven Wojtczuk

Co-Investigator:

Steven Wojtczuk

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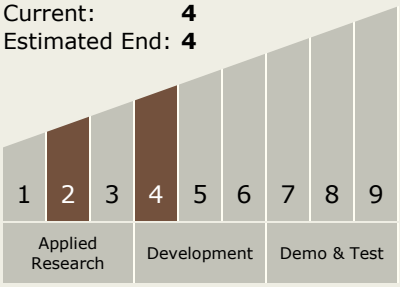
Completed Technology Project (2011 - 2011)

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.6 Other Advanced Concepts for Generating/Converting Power

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System